

IN THE DRAWINGS:

Subject to the approval of the Examiner, please amend the drawings as set forth in the Request for Approval of Drawing Change filed concurrently herewith.

REMARKS

Claims 9-16 are currently pending in this application.

In the Office Action, the Examiner objected to the drawings as including reference numbers not mentioned in the description and as using one reference number to designate two different areas; rejected claims 9-15 under 35 U.S.C. § 102(b), as being anticipated by Libove et al. (U.S. Patent No. 4,574,240); and rejected claim 16 under 35 U.S.C. § 103(a) as being unpatentable over Libove et al.

With regard to the objection to the drawings, Applicants submit herewith a Request for Approval of Drawing Change, indicating in red amendments to the originally filed drawings. Applicants believe the proposed changes to the drawings render moot the Examiner's objection to the drawings. Accordingly, Applicants respectfully request that the Examiner reconsider and withdraw this objection. Applicants respectfully traverse the prior art rejections of the claims for the following reasons.

The present invention recited, for example, in claim 9, and claims 10-16 at least by virtue of dependence, comprises a combination of elements, including detecting a central area and first areas of the spatial frequency space, the first areas being a first distance from the central area; detecting the central area and second areas of the spatial frequency space, the second areas being a second distance from the central area; and detecting the central area and third areas of the spatial frequency space, the

third areas being a third distance from the central area. Thus, all of claims 9-16 recite an imaging process with detecting steps in the spatial frequency space (or domain).

The *spatial frequency domain* is a space in which each image value at an image position represents the amount that the intensity values in the image vary over a specific distance related to the image position. In the spatial frequency domain, changes in the image position correspond to changes in the spatial frequency, or the rate at which the image intensity values are changing in the image.

In contrast, Libove et al. disclose a method for flow measurement using nuclear magnetic resonance (NMR) in the image domain. In contrast to the *spatial frequency domain*, the *image domain* is the normal image space in which a change in position in the image directly projects to a change in position in the scene. In the image domain, distances in the image (in pixels) correspond to real distances (e.g., in meters) in the scene. Thus, Libove et al. is fundamentally different than the present invention recited in claims 9-16.

The Examiner's reliance upon portions of Libove et al. are, respectfully, misplaced. For example, the Examiner relies upon the Abstract and Figure 1 of the reference as disclosing "detecting a central area and first areas of the spatial frequency space, the first areas being a first distance from the central area." However, Figure 1 merely shows reconstructed images for different image positions that may be used to calculate flow data using an NMR technique. The Examiner also relies upon the col. 11, lines 55-68 and Figure 1 of the reference as disclosing "detecting the central area and third areas of the spatial frequency space, the third areas being a third distance from the central area." Col. 11, lines 55-68, however, merely describes what is being shown in Figure 1.

Other portions of Libove et al. show that the reference is solely concerned with the image domain, in contrast to the spatial frequency space recited in claims 9-16. “[T]he process of the present invention is particularly useful in the development of a two-dimensional map of flow data.... This is achieved by combining the methods described above with conventional NMR imaging techniques for providing a two-dimensional signal array.” (Col. 10, lines 26-29). The described methods are set forth at col. 9, lines 13-17: “This is done by using nonoverlapping volumes separated by a gap whose width increase with each successive repetition and thus defines a progressively increasing threshold velocity. The signals are then compared or combined to generate a distribution.” The term “gap” refers to a spatial extension in relation to a slice thickness (see col. 9, lines 23-28), and the term “distribution” refers to a velocity distribution (see col. 8, lines 40-44). Indication that the image domain is being operated on is shown by the fact that the signals are “compared or combined.” The entire two-dimensional images, called sub-images, are generated when imaging is applied. (Col. 11, lines 24-29). The crucial point is that “[t]hese sub-images may then be combined in any of several ways, to produce a highly accurate two-dimensional image of the planar volume, which displays the entire range of flow velocities being measured.” (Col. 11, lines 31-35). Thus, any operation for calculating maps of flow data relies upon data in the image domain, and not in the spatial frequency domain.

In conclusion, the method disclosed by Libove et al. uses conventional two-dimensional imaging in combination with a special kind of position of slices through the object under study. The resulting signals are Fourier transformed prior to post-processing steps to gain maps of flow data. There is no mention of using only limited regions of the spatial frequency domain space to acquire

different sets of spatial frequency data. In fact, Figure 1 of Libove et al. does not depict spatial frequency domain data, as is assumed by the Examiner.

In light of the above, Applicants submit that claims 9-16 are patentably distinguishable from Libove et al. Applicants, therefore, respectfully request that the Examiner reconsider and withdraw the Section 102(b) and 103(a) rejections of these claims.

Applicants respectfully request that this Amendment under 37 C.F.R. § 1.116 be entered by the Examiner, placing claims 9-16 in condition for allowance.

Applicants respectfully point out that the final action by the Examiner presented some new arguments as to the application of the art against Applicants' invention. It is respectfully submitted that the entering of the Amendment would allow the Applicants to reply to the final rejections and place the application in condition for allowance.

Finally, Applicants submit that the entry of the Amendment would place the application in better form for appeal, should the Examiner dispute the patentability of the pending claims.

In view of the foregoing remarks, Applicants submit that the claimed invention is neither anticipated nor rendered obvious in view of the prior art reference cited against this application. Applicants therefore request the entry of this Amendment, the Examiner's reconsideration of the application, and the timely allowance of the pending claims.

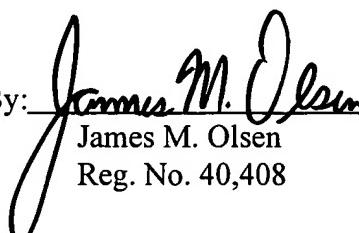
If there are any other fees due in connection with the filing of this response, please charge the fees to our Deposit Account No. 03-2775. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such an extension is requested and the fee should also be charged to our Deposit Account.

Respectfully submitted,

CONNOLLY BOVE LODGE & HUTZ LLP

Dated: October 7, 2002

By:

James M. Olsen

Reg. No. 40,408